FIG. 1

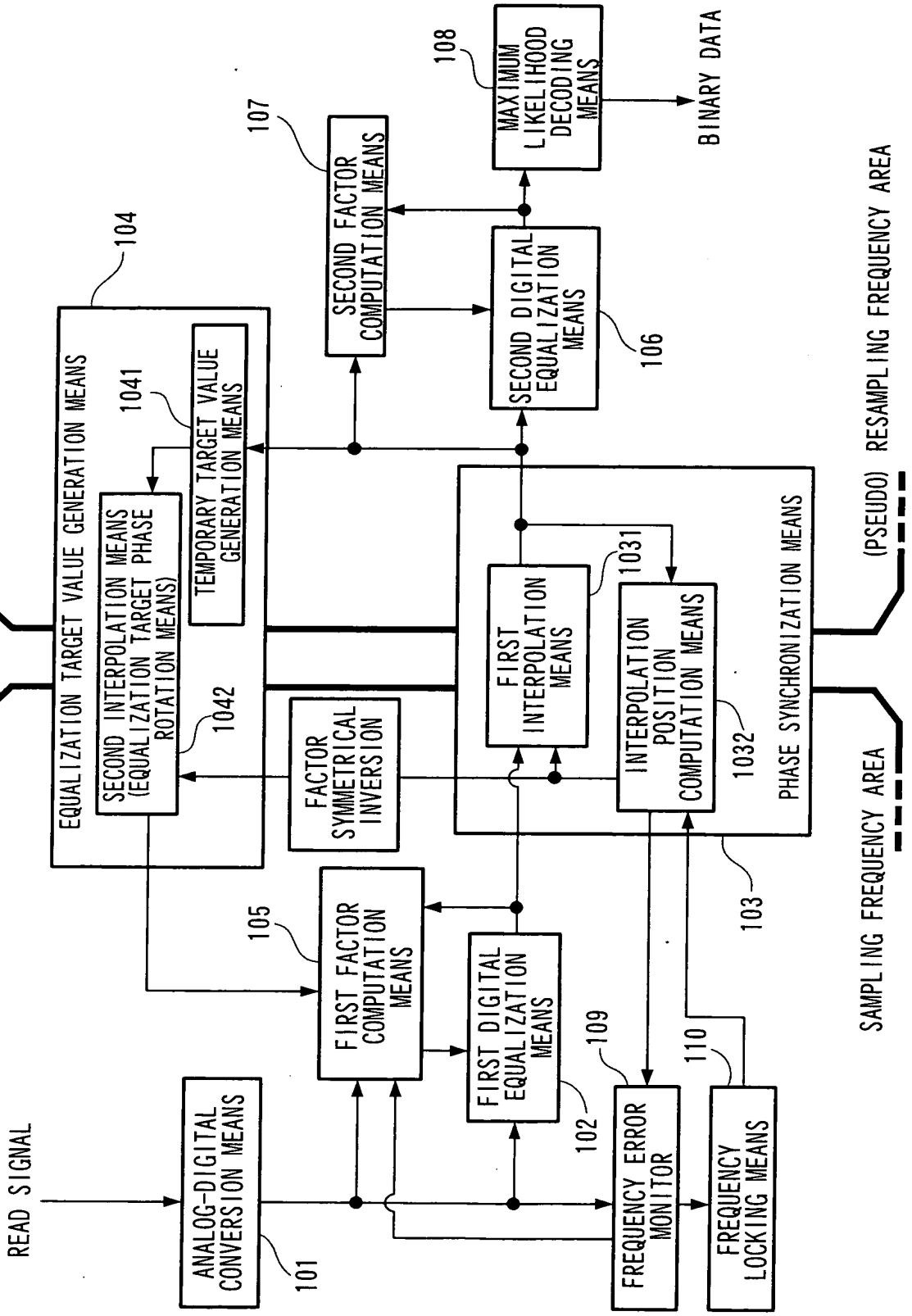
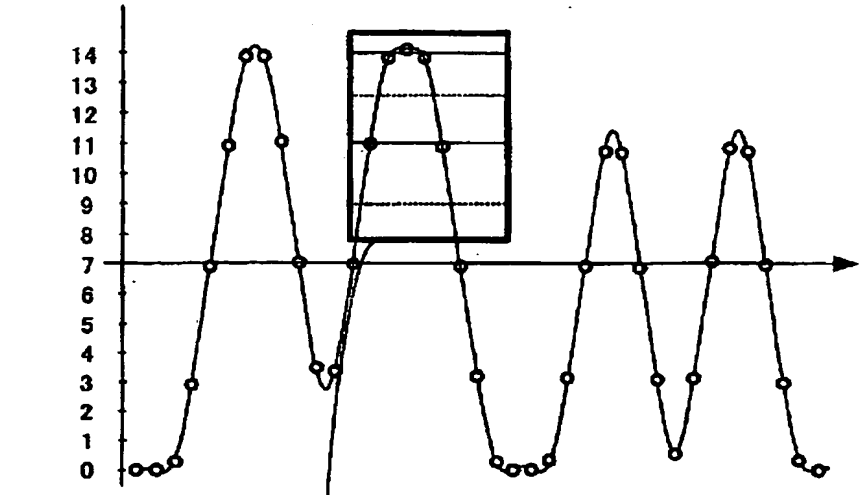
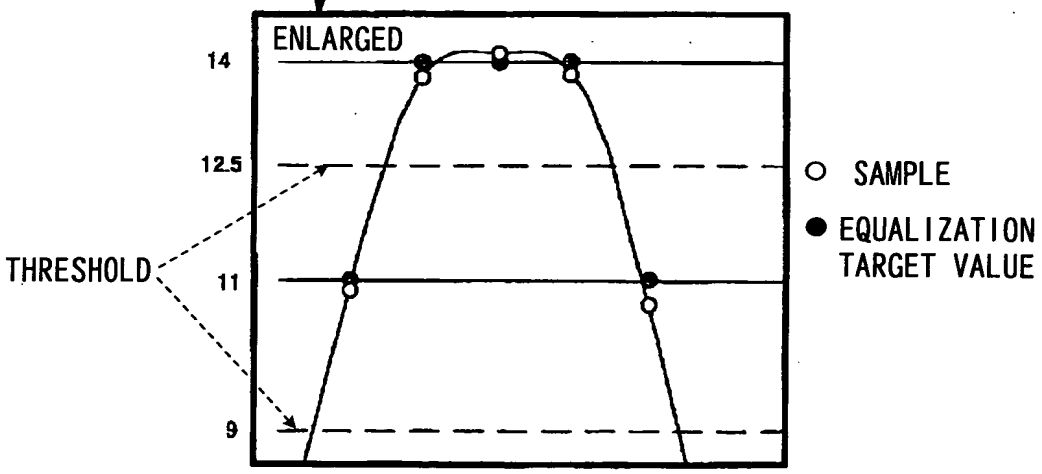

READ SIGNAL
ANALOG-DIGITAL CONVERSION MEANS
101
FIRST FACTOR COMPUTATION MEANS
105
FIRST DIGITAL EQUALIZATION MEANS
102
FREQUENCY ERROR MONITOR
109
FREQUENCY LOCKING MEANS
110
SAMPLING FREQUENCY AREA
(PSEUDO) RESAMPLING FREQUENCY AREA
PHASE SYNCHRONIZATION MEANS
103
FIRST INTERPOLATION MEANS
1031
INTERPOLATION POSITION COMPUTATION MEANS
1032
FACTOR SYMMETRICAL INVERSION
EQUALIZATION TARGET VALUE GENERATION MEANS
104
SECOND INTERPOLATION MEANS (EQUALIZATION TARGET PHASE ROTATION MEANS)
1042
TEMPORARY TARGET VALUE GENERATION MEANS
1041
SECOND FACTOR COMPUTATION MEANS
107
SECOND DIGITAL EQUALIZATION MEANS
106
MAXIMUM LIKELIHOOD DECODING MEANS
108
BINARY DATA

FIG. 2



(a) SIGNAL EQUALIZED TO EPR4
NOISE (INCLUDING EQUALIZATION ERROR) EXISTS



(b) ESTIMATION OF EQUALIZATION
TARGET VALUE BY THRESHOLD

FIG. 3

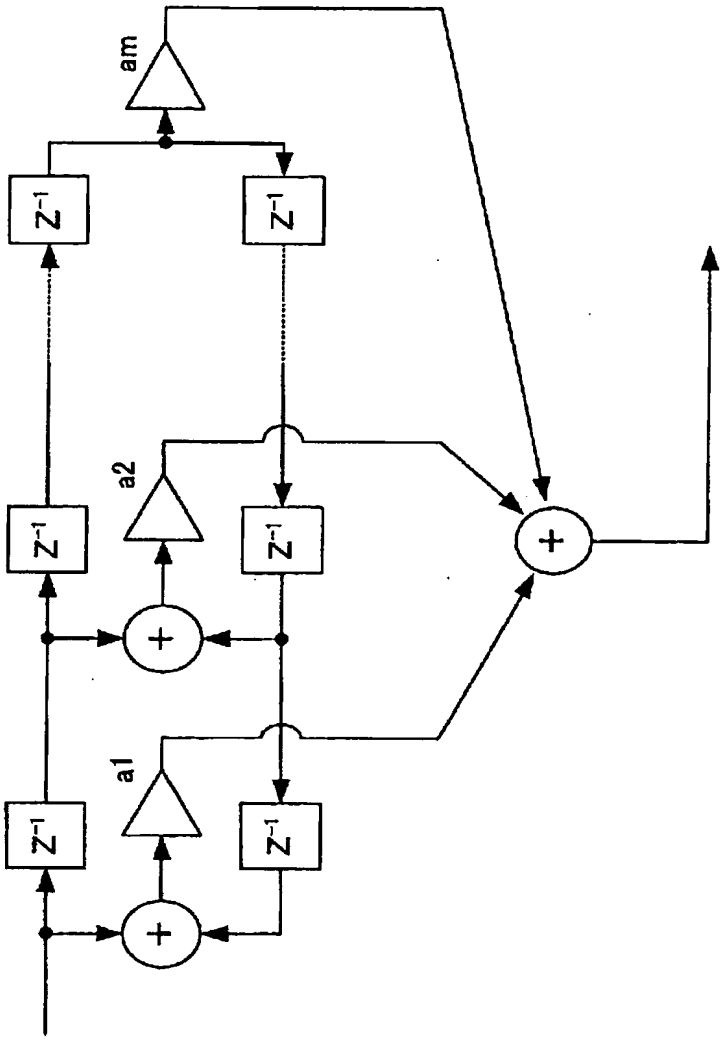


FIG. 4

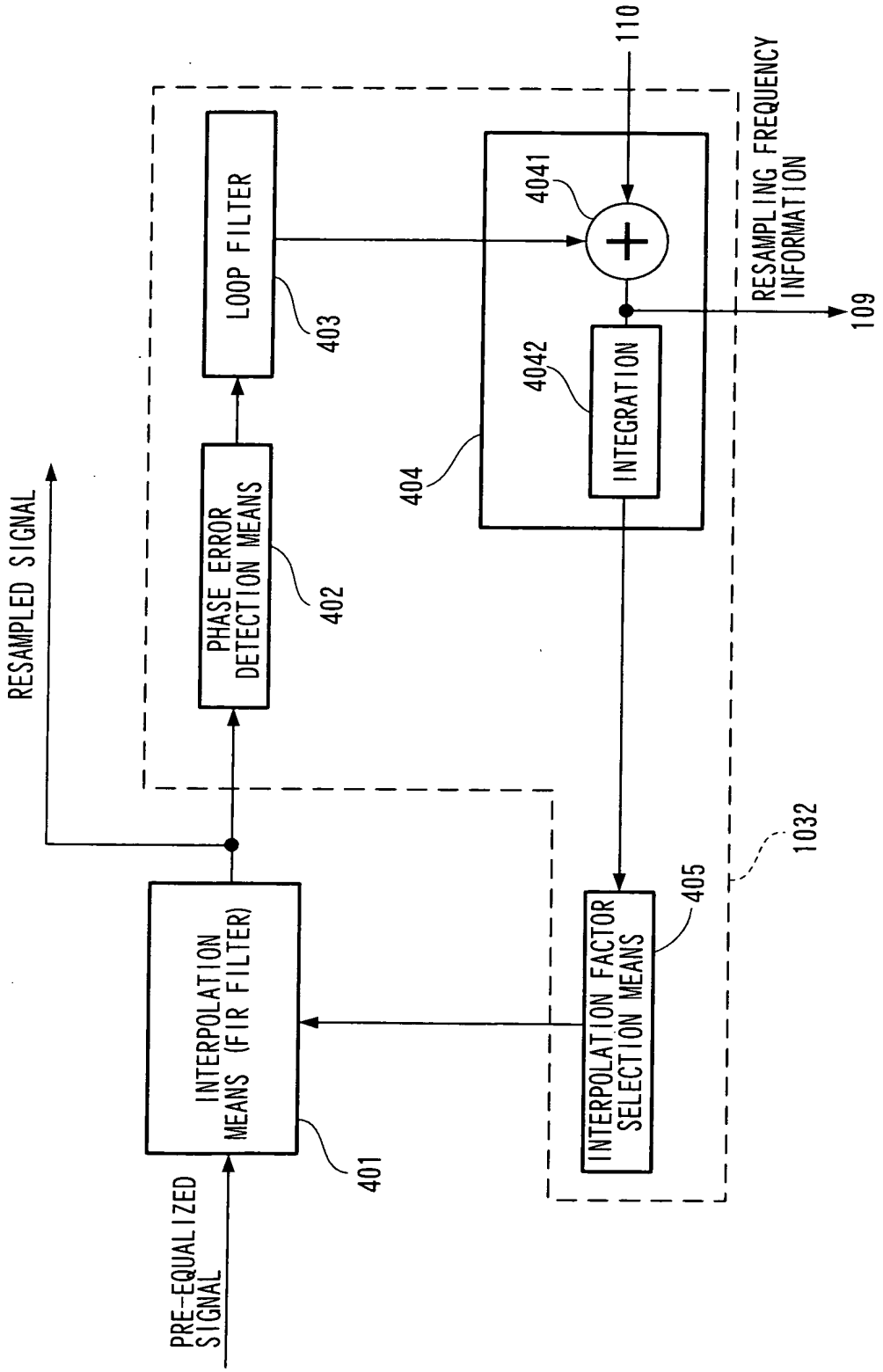

PRE-EQUALIZED SIGNAL
INTERPOLATION MEANS (FIR FILTER)
401
RESAMPLED SIGNAL
PHASE ERROR DETECTION MEANS
402
LOOP FILTER
403
404
4041
4042
INTEGRATION
110
RESAMPLING FREQUENCY INFORMATION
109
INTERPOLATION FACTOR SELECTION MEANS
405
1032

FIG. 5

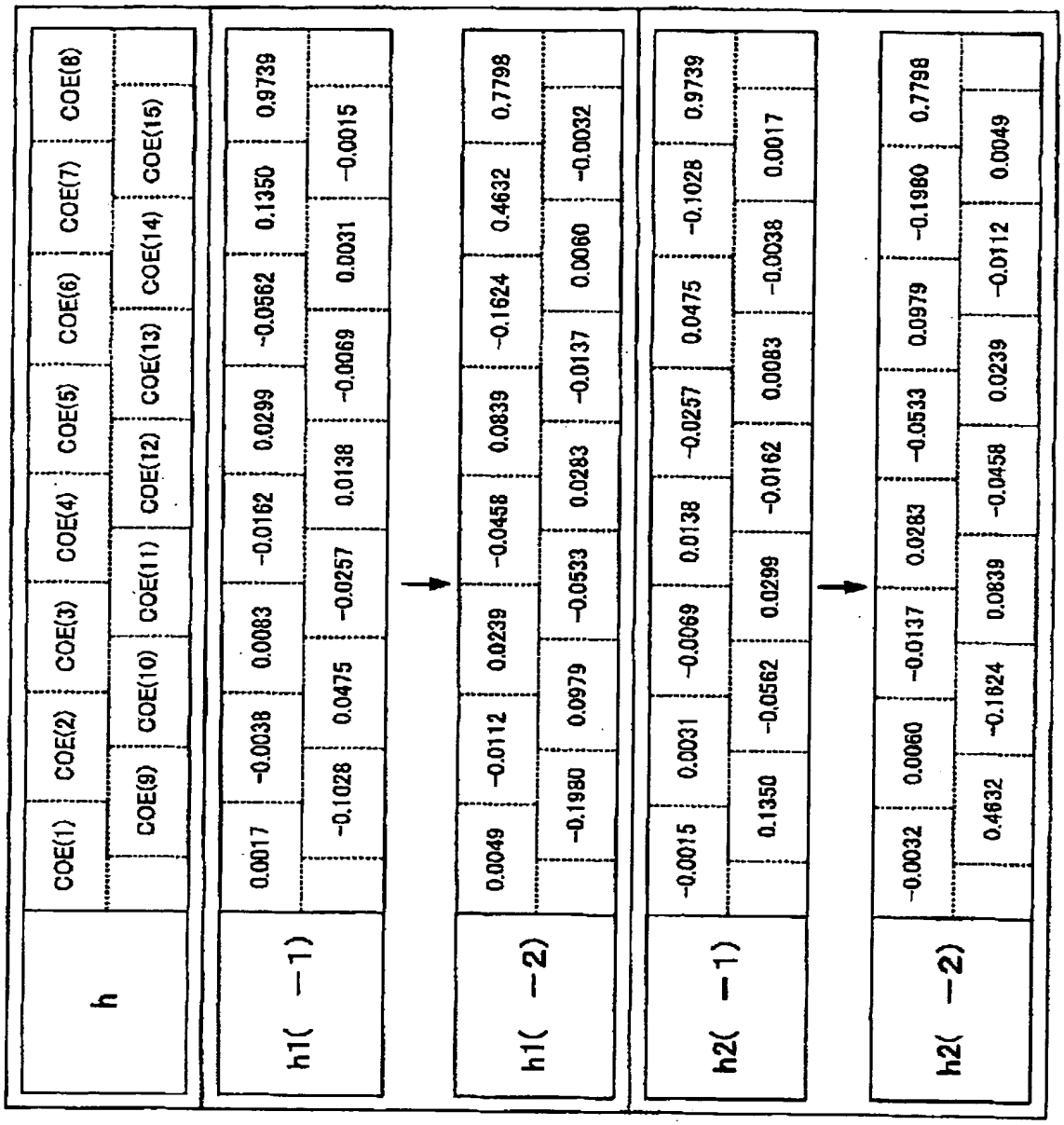
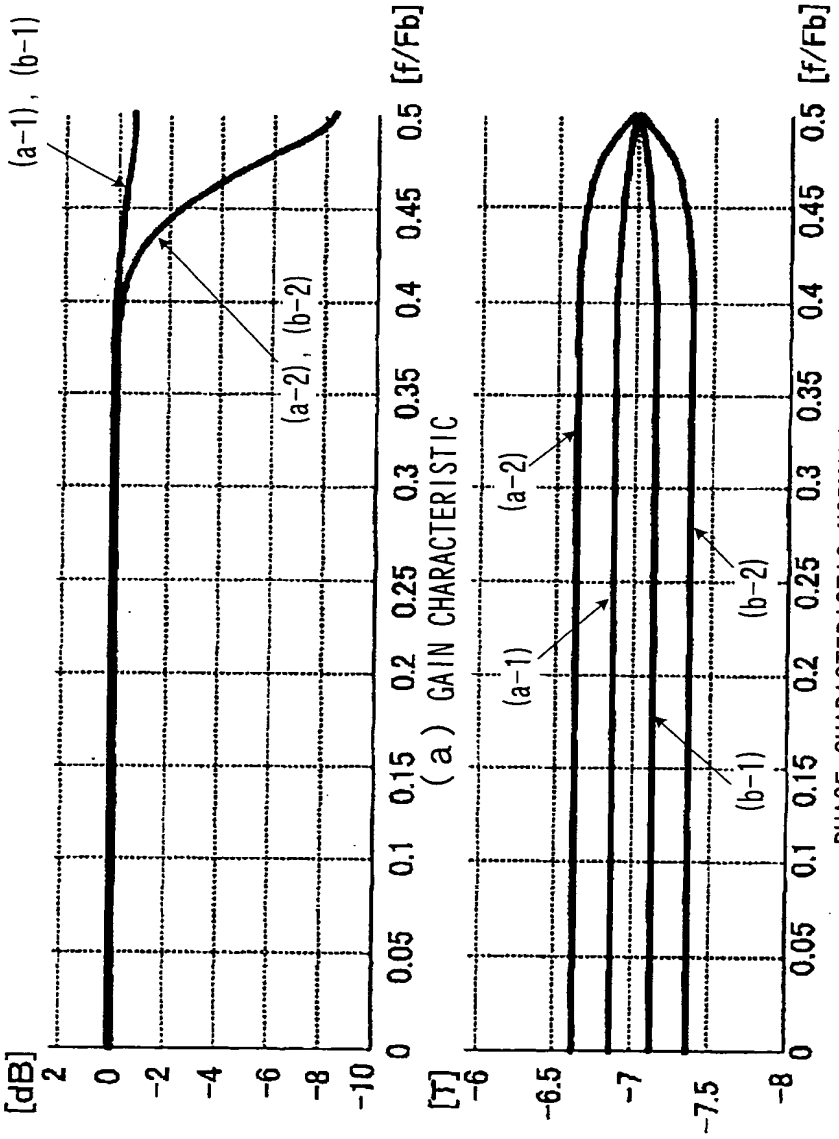

h
COE(1) COE(2) COE(3) COE(4) COE(5) COE(6) COE(7) COE(8)
COE(9) COE(10) COE(11) COE(12) COE(13) COE(14) COE(15)
h1(−1)
0.0017 −0.0038 0.0083 −0.0162 0.0299 −0.0562 0.1350 0.9739
−0.1028 0.0475 −0.0257 0.0138 −0.0069 0.0031 −0.0015
h1(−2)
0.0049 −0.0112 0.0239 −0.0458 0.0839 −0.1624 0.4632 0.7798
−0.1980 0.0979 −0.0533 0.0283 −0.0137 0.0060 −0.0032
h2(−1)
−0.0015 0.0031 −0.0069 0.0138 −0.0257 0.0475 −0.1028 0.9739
0.1350 −0.0562 0.0299 −0.0162 0.0083 −0.0038 0.0017
h2(−2)
−0.0032 0.0060 −0.0137 0.0283 −0.0533 0.0979 −0.1980 0.7798
0.4632 −0.1824 0.0839 −0.0458 0.0239 −0.0112 0.0049

FIG. 6



(a-1)→(a-2)	(-6.88) − (-6.63) = -0.25
(b-1)→(b-2)	(-7.12) − (-7.37) = 0.25

(C) CHANGE OF PHASE CHARACTERISTIC (FLAT BAND)

FIG. 7

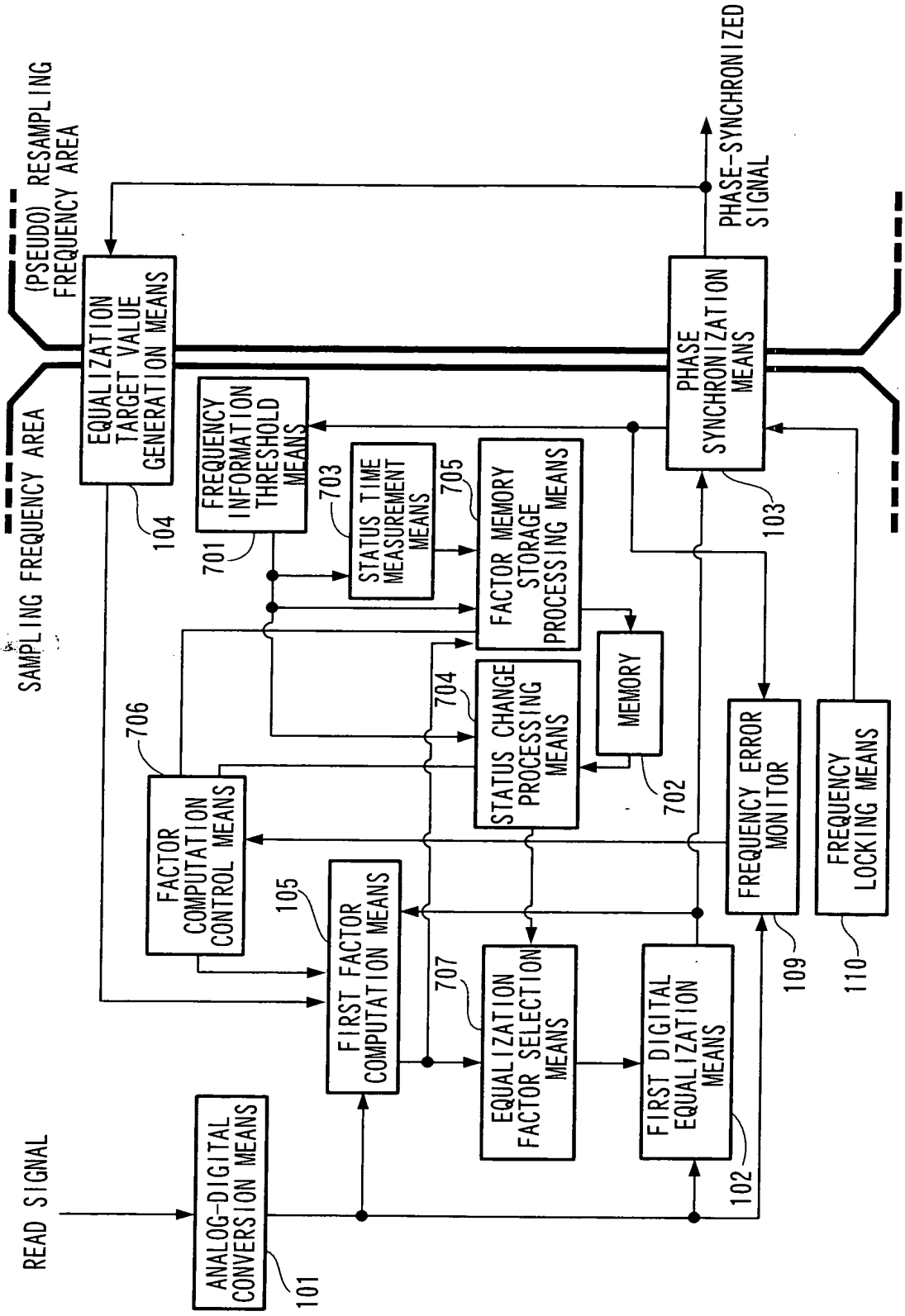

READ SIGNAL
ANALOG-DIGITAL CONVERSION MEANS
101
FIRST FACTOR COMPUTATION MEANS
105
FACTOR COMPUTATION CONTROL MEANS
706
EQUALIZATION FACTOR SELECTION MEANS
707
FIRST DIGITAL EQUALIZATION MEANS
102
STATUS CHANGE PROCESSING MEANS
704
MEMORY
702
FACTOR MEMORY STORAGE PROCESSING MEANS
705
STATUS TIME MEASUREMENT MEANS
703
FREQUENCY INFORMATION THRESHOLD MEANS
701
EQUALIZATION TARGET VALUE GENERATION MEANS
104
SAMPLING FREQUENCY AREA
(PSEUDO) RESAMPLING FREQUENCY AREA
PHASE SYNCHRONIZATION MEANS
103
PHASE-SYNCHRONIZED SIGNAL
FREQUENCY ERROR MONITOR
109
FREQUENCY LOCKING MEANS
110

FIG. 8

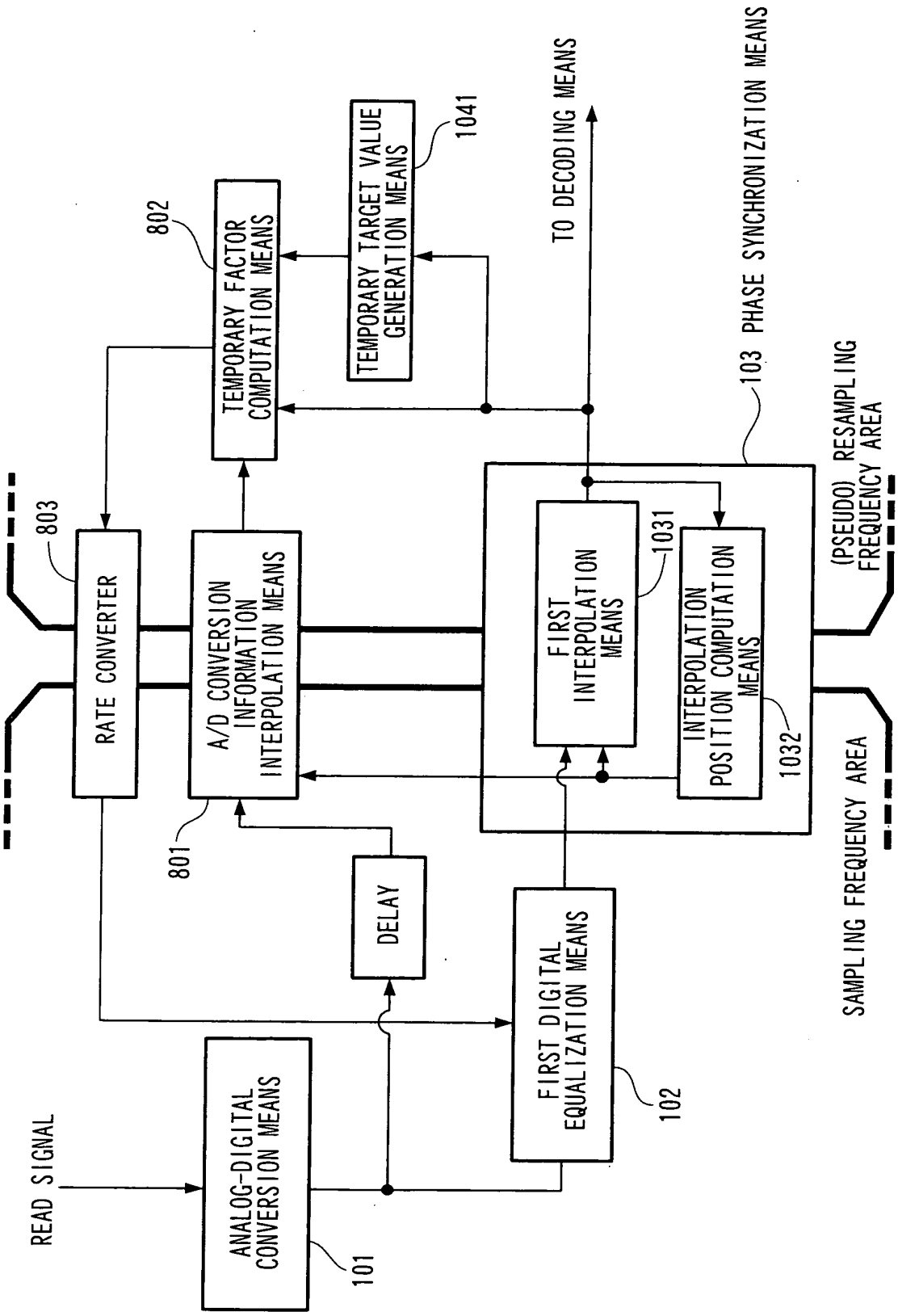

READ SIGNAL
ANALOG-DIGITAL CONVERSION MEANS
101
FIRST DIGITAL EQUALIZATION MEANS
102
DELAY
801
A/D CONVERSION INFORMATION INTERPOLATION MEANS
RATE CONVERTER
803
TEMPORARY FACTOR COMPUTATION MEANS
802
TEMPORARY TARGET VALUE GENERATION MEANS
1041
TO DECODING MEANS
103 PHASE SYNCHRONIZATION MEANS
FIRST INTERPOLATION MEANS
1031
INTERPOLATION POSITION COMPUTATION MEANS
1032
(PSEUDO) RESAMPLING FREQUENCY AREA
SAMPLING FREQUENCY AREA

FIG. 9

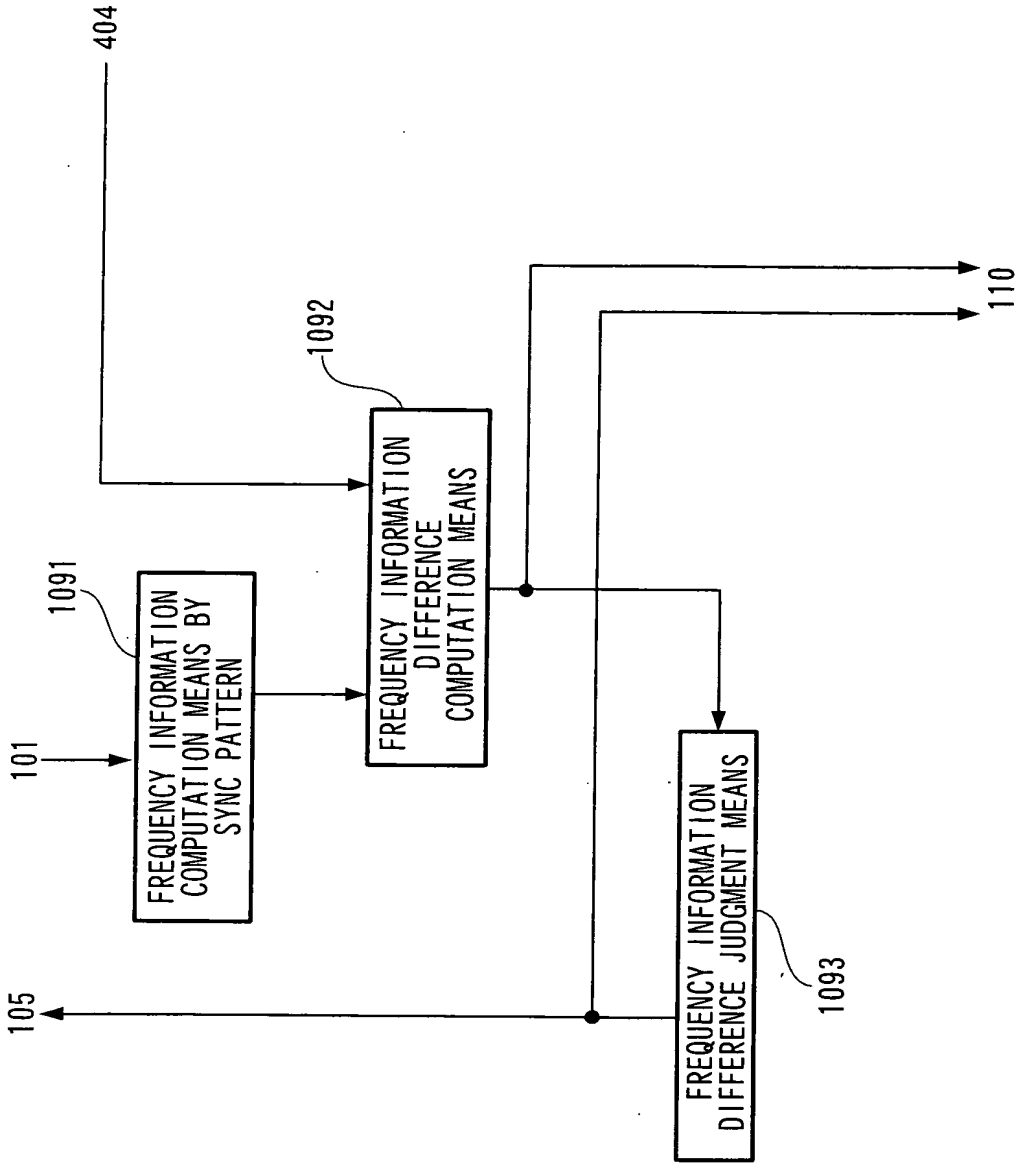

404
1092
110
1091
FREQUENCY INFORMATION COMPUTATION MEANS BY SYNC PATTERN
FREQUENCY INFORMATION DIFFERENCE COMPUTATION MEANS
101
FREQUENCY INFORMATION DIFFERENCE JUDGMENT MEANS
1093
105

FIG. 11

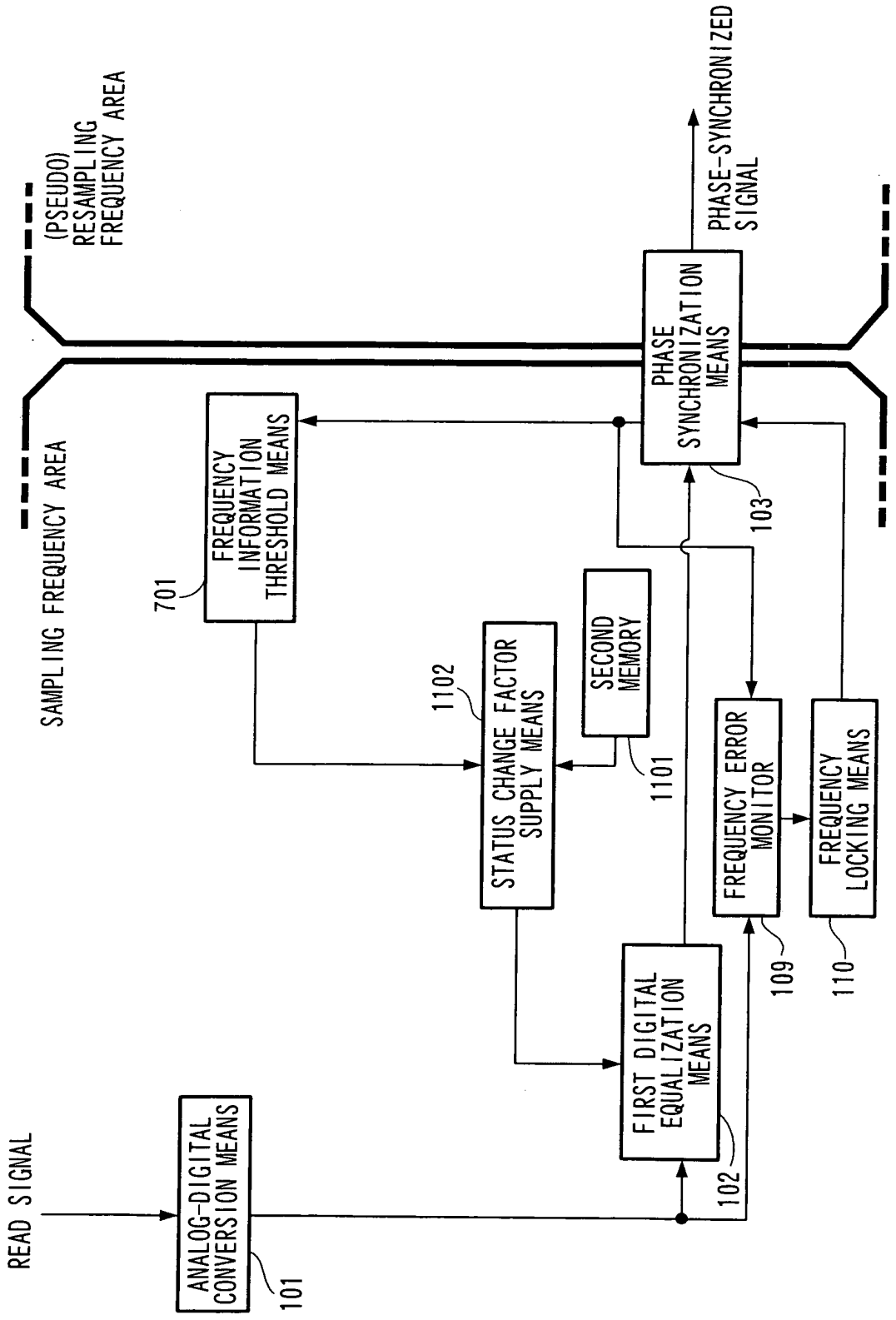
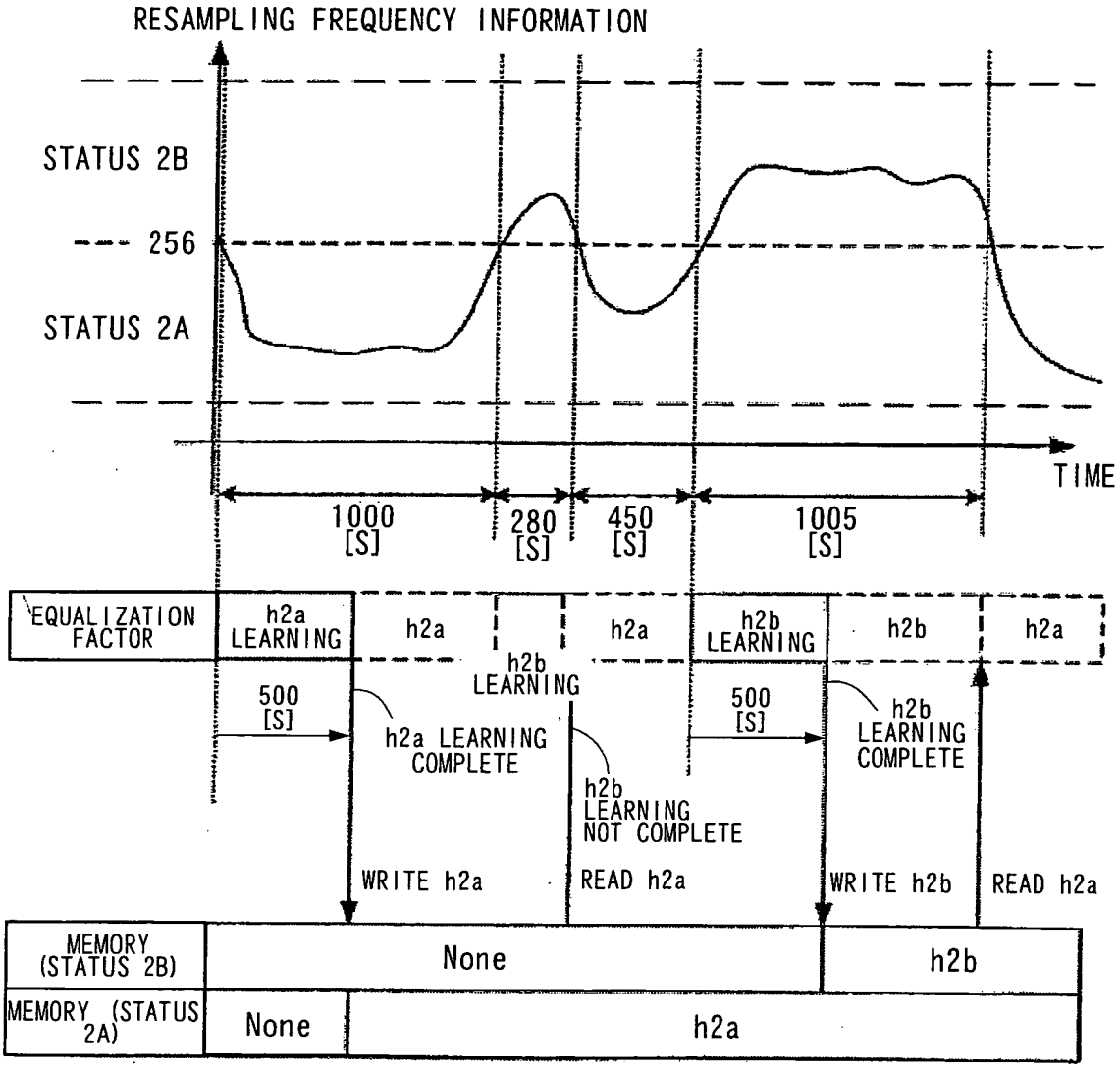

READ SIGNAL
ANALOG-DIGITAL CONVERSION MEANS
101
FIRST DIGITAL EQUALIZATION MEANS
102
PHASE SYNCHRONIZATION MEANS
103
PHASE-SYNCHRONIZED SIGNAL
SAMPLING FREQUENCY AREA
(PSEUDO) RESAMPLING FREQUENCY AREA
FREQUENCY INFORMATION THRESHOLD MEANS
701
STATUS CHANGE FACTOR SUPPLY MEANS
1102
SECOND MEMORY
1101
FREQUENCY ERROR MONITOR
109
FREQUENCY LOCKING MEANS
110

FIG. 10


RESAMPLING FREQUENCY INFORMATION
STATUS 2B
256
STATUS 2A
TIME
1000 [S]
280 [S]
450 [S]
1005 [S]
EQUALIZATION FACTOR
h2a LEARNING
h2a
h2a
h2b LEARNING
h2b
h2a
500 [S]
h2a LEARNING COMPLETE
h2b LEARNING
h2b LEARNING NOT COMPLETE
500 [S]
h2b LEARNING COMPLETE
WRITE h2a
READ h2a
WRITE h2b
READ h2a
MEMORY (STATUS 2B)
None
h2b
MEMORY (STATUS 2A)
None
h2a